Appendix B: Control of Non-Native Invasive Plant Species Guide

Framework of Best Management Practice

According to a survey conducted by the U.S. Department of Agriculture on the rangelands in the west, western wild lands are being lost at an alarming rate of 4,600 acres per day to non-native invasive plant species (U.S. Department of the Interior 1977). This estimate should be considered conservative due to the lack of careful inventories in many regions, and translates to a 14% annual increase in the number of acres infested. If the infestation continues at this rate it is predicted that as many as 38 million acres of western wild lands alone will be taken over by non-native invasive species by the year 2005. Due to globalization of trade, increased speed of travel cargo shipments, and mankind's ever-increasing mobility, non-native plant species have been extensively introduced to new locations around the world. Often these new species spread rapidly because they have no effective natural enemies in their new locations. In the United States, it is estimated that 50% to 75% of problem weeds were either accidental or intentional human introductions from other areas (Wheeden 1999). It has been estimated that NNIPS cost the United States approximately $27 million annually for herbicide alone (Pimentel 1999). Traditional methods of weed control, such as mechanical methods and use of herbicides, are neither practical nor desirable for such wide-ranging stands of non-native invasive plant species; biological control has become a viable strategy for their control.

Management of invasive species problems is usually the responsibility of government agencies, which must select targets for management and develop management strategies. With a growing number of invasive species problems due to increased mobility between military installations and recognition of the severity of the threat to conservation, managers of military lands are confronted with more potential targets than their resources can address. Therefore, these managers need an understanding of the natural history of an invasive species, its status in the country, and its specific impact in ecological and economic terms. There is a general lack of scientific methodology for evaluating the risk posed by invasives to biodiversity, and for understanding the complex relations of non-native invasive species within plant communities and the environment. These invasive species may be symptoms of other ecological problems (e.g., overgrazing of grasslands, eutrophication of waterways due to erosion, etc.), such that management of particular invasives may not provide a lasting solution, and/or may lead to their replacement by other invasive species.

There are three principle approaches to control NNIPS: (1) physical/mechanical (2) chemical, and (3) biological. Treatments that suppress or retard the growth of NNIPS, while presenting the least risk to applicators, site users, and environment, are preferable to those that have more toxic or broad-spectrum effects. Physical (mechanical) and biological control agents usually fit this description, as do some careful applications of herbicides. Each has been successful in specific instances and there is considerable potential for integration of the approaches. New technologies, particularly those involving genetic manipulation are in development against a range of target invasives. In addition, the risks and environmental impact of selected control measures must be weighed against the benefits achieved to ensure best management practices.

Physical/Mechanical Controls

Heat Treatment

Various systems have been invented to deliver high temperatures to kill foliage of plants. These include flamers, hot water or steam applicators, and infrared radiation applicators, which destroy plant cellular function. It is only necessary to heat the leaf long enough to destroy the waxy cuticle of the leaf and disrupt the cells. Torching or boiling the plants until damage can be seen immediately is unnecessary and may stimulate regrowth of some established perennials such as morning glory (*Ipomoea sp.*). Effects of heating may be visible in as little as an hour or may take up to several days to appear. Seedlings, annuals, young perennials, and germinating seeds are most susceptible to heat damage. They are usually killed by a single treatment. None of the treatments penetrates into the soil or below a layer of gravel; therefore, they do not kill the roots of established perennials. Perennial species may require three or more treatments in a season to deplete the roots and kill the plant. Broadleaf invasives are more easily damaged by heat than grasses. The growing tips of grasses are encased in a heat resistant sheath, which makes it possible to selectively control weeds in turf using heat. Some other plants are quite susceptible to heat. Using heat to control non-native invasive species is ideal where selective control is required.

Flamers have been in use for more than 50 years to destroy vegetation. They produce temperatures of approximately 900 ºC. Several sizes are available from hand-held models to large tractor- or truck-mounted models.

Hot water or steam applicators have become widely used in the past 10 years due to their higher safety ratings. Temperatures reach 100-200 ºC. While these are currently very large truck/tractor-mounted applicators, smaller hand-held models are being developed.

Infrared radiation applicators burn propane fuel to produce a radiant heat source. Equipment now available includes a wide range of hand-held applicators for spot treatments and include hand-propelled or tractor-mounted units for broader treatments.

Mulches for Weed Control

Mulches are soil coverings of organic materials (e.g., compost, straw, shredded bark, pine needles, wood chips, saw dust) or various synthetic materials such as plastic sheeting or landscape fabrics (geotextiles). A common combination is a geotextile weed mat covered with a layer of bark or gravel. Mulches suppress weeds by blocking the light they need to grow. As soon as the seeds germinate, they require light for continued growth. Some seeds will not even germinate unless they are exposed to bright light. To be effective at suppressing weeds, organic mulches should be at least 10 centimeters thick for heavy, dense materials (compost) and at least 16 centimeters thick for lighter materials (pine needles). Mulches should be applied as soon as the soil is cultivated or disturbed because weed seeds brought to the surface start to germinate immediately. **Note:** Using fresh saw dust, wood chips, or straw as mulch can temporarily rob the soil of nitrogen as the materials decompose.

Hand Pulling ("manual control")

Hand and mechanical pulling has been around since the dawn of agriculture. It is by far the least invasive method of control for weeds. Studies done by The Nature Conservancy (TNC) have shown that "weeding," while labor intensive and expensive, can effectively reduce small patches of NNIPS. When used in combination with other control techniques, control can reach up to 100%. At the University of Colorado, Professor Tim Seastedt has started a new program studying the use and effectiveness of hand pulling to control NNIPS. While hand pulling of weeds may in fact be the oldest method of control, it has

been recently enhanced. Today, many specific tools exist to reduce the number of man-hours and increase the effectiveness of the laborer. An example of such a tool is the "Weed Wrench" that allows the individual to extract woody plants having an extensive root system which would prevent hand pulling.

Mowing

Mowing diffuse knapweed (*Centurea diffusa*) reduces seed production up to 85% during critical stages compared to un-mowed areas (Roche and Roche 1993). For certain thistles and grasses, it has been shown that mowing at seed onset reduces the spread, thereby maintaining the current NNIPS population. Although mowing can be an effective mechanism for NNIPS control, it is vital that mowing take place during the optimum life stage of the NNIPS, thereby avoiding the risk of increasing NNIPS populations.

Chemical Controls

Herbicides

Herbicides work through several modes of action, including the inhibition of electron transport, growth regulation through auxin/cytokinin mimicry, amino acid synthesis inhibition, seedling growth inhibition, photosynthesis inhibition, lipid synthesis inhibition, cell membrane disruption, and pigment inhibition. Herbicides can be divided into two categories: selective and non-selective. Selective herbicides affect some types of plants, but not others. For example, several herbicides kill broadleaf weeds, but do not affect grasses. Non-selective herbicides can kill any type of plant. They are used to control all vegetation in an area or as spot treatments on deep-rooted plants and those that spread by rhizomes. Herbicides remain general in their specificity, with a host of side effects and application problems. Claims of herbicide efficacy using extremely small amounts are usually based on mixtures that are more concentrated and therefore more hazardous. If chemical controls are necessary, the least toxic, effective herbicide should be used.

The following criteria for product selection should be used:

- It must be effective and registered for the specific weed type,
- It must be applied as a spot treatment instead of broadcast application where possible,
- It should be applied at the optimum time of day and/or year to have greatest impact on target species, and
- It does not have long-term residual effects.

Fatty Acids

Naturally occurring fatty acid compounds are used in production of soaps. In the right concentration, they will kill plant foliage. They act quickly, with results sometimes evident within two hours. They do not kill the roots of established plants. There is no herbicidal activity in the soil and no residual effect. Fatty acids are most effective on seedlings and annual plants. They also suppress or top-kill some perennials. FAS should be applied in spring or summer to actively growing plants, less than 13 cm tall. Repeat applications are required to kill established plants and perennials.

Corn Gluten Meal

A new, non-toxic herbicide made from extracts of food-grade corn gluten meal has been registered in the United States. It works by suppressing the germination of seeds. Regular use on turf grass has shown a 50-60% drop in weed infestation within the first year, and higher levels of control in later years (Bingaman, McDade, and Christians 1995; see http://www.hort.iastate.edu/gluten/).

Dandelion Mycoherbicide

Researchers at McGill University in Montreal (U.S. Patent #5,994,267, "*Sclerotinia minor* for broad spectrum broadleaf weed control") have discovered a strain of fungus (*Sclerotinia minor*) that kills dandelions and other broadleaf weeds without harming surrounding grasses. In suitable conditions, control has been shown to be more effective and twice as fast as herbicides containing 2,4-D, mecoprop and dicamba.

Biological Control

Using biological agents for weed control is the most beneficial of all methods for reducing the spread of NNIPS while reducing cost and dangerous herbicide use. Once a population of biocontrol agents is established, minimal effects are required to maintain it. In addition, the use of natural enemies does not require a high level of economic or technologic input. Another benefit is that natural enemies are less ecologically disruptive, thereby maintaining natural biodiversity. Many insect and microbial controls are currently being developed by the USDA and universities (e.g., Agricultural Research Service, University of Illinois, University of Hawaii).

Leafy spurge and knapweed are at the forefront of targeted species. A concerted USDA effort to bring them under control using several dozen insect and microbial agents is proving to be very successful (http://www.nps.ars.usda.gov/programs/usmap.htm?stateabbr=mt&npnumber=304). Such intensive programs will potentially succeed, resulting in a decrease of NNIPS. The research and subsequent release of agents carries with it the risk that unintended hosts could be attacked and decimated; there are examples showing this has occurred (Bess and Haramoto 1972, Duan and Messing 1998, Follett and Duan 2000, and Howarth 1991). Research requires time and quarantine before release. Although safeguards are thorough, not every native plant and growing environment can be tested. Some desirable characteristics of biological control agents would include:

- They are generally specific to one plant species,
- They have a marked negative impact on plant individuals and the population dynamics of the target species,
- They are prolific,
- They thrive and become widespread in all habitats and climates in which the target species occurs, and
- They are good colonizers.

Re-cap

Physical/mechanical, chemical, and biological Best Management Practices (Table B1) are generally most effective when used in combination with one another. Not all BMPs are appropriate for each species. Many species will react positively to certain controls, resulting in an increase in population size. Therefore, it is vital to know the target NNIPS ecology, pathology, systemics, etc. That knowledge will allow the land manager to choose appropriate BMPs having the greatest chance for success, resulting in a savings on time, dollars, and NNIPS spread.

Table B1. Chemical, physical/mechanical, and biological BMPs.

Scientific Name	**Common Name**	**Chemical**	**Mechanical**	**Biological**
Acaena novae-zelandica	biddy biddy	None	Pull, bag & burn	*Ucona acaenae*
Acer ginnala	Amur maple	Glyphosate	Repeated cutting	None
Acer platanoides	Norway maple	Glyphosate	Repeated cutting	None
Achnatherum brachychaetum	punagrass	Sethoxydim; Clethodim	Frequent mowing	None
Acroptilon repens	Russian knapweed	Chlorsulfuron; 2, 4-D	Repeated mowing	*Aphthona* sp. *Subanguina picridis*
Aegilops cylindrica	jointed goatgrass	Glyphosate + 2, 4-D	Burning, tillage	None
Aegilops geniculata	ovate goatgrass	Glyphosate + 2, 4-D	Burning, tillage	None
Aegilops triuncialis	barbed goatgrass	Glyphosate + 2, 4-D	Burning, tillage	None
Ageratina adenophora	glad bearing thoroughwort	Glyphosate	Pull, dig	None
Agropyron desertorum	crested wheatgrass	Glyphosate	Pull, dig	None
Agrostis gigantea	redtop	Glyphosate	Pull, dig	None
Albizia julibrissin	silk tree, mimosa	Accord; Roundup; Garlon	Repeated mowing	None
Albizia lebbeck	woman's tongue tree	Accord; Roundup; Garlon	Repeated mowing	None
Alhagi maurorum	camelthorn	Tordon 22K; 2, 4-D	None	None
Alliaria petiolata	garlic mustard	Roundup	Pull, bag & burn	None
Ammophila arenaria	European beachgrass	Roundup; salt	Dig	None
Ampelopsis brevipedunculata	peppervine	Triclopyr; Glyphosate	Pull, bag & burn	None
Anagallis arvensis	scarlet pimpernel	Glyphosate	Repeated cutting	None
Anchusa arvensis	annual bugloss	Phenoxy	None	None

Scientific Name	Common Name	Chemical	Mechanical	Biological
Anchusa officinalis	common bugloss	Phenoxy	None	None
Anthemis arvensis	scentless chamomile	Glyphospate	Pull or dig	None
Anthemis cotula	mayweed chamomile	Glyphospate	Pull or dig	None
Anthoxanthum odoratum	sweet vernalgrass	Dalapon	Pull, till, or repeated mowing	None
Anthriscus sylvestris	cow parsely	Mecoprop; Dicamba; Dichlorprop	Pull, till, or repeated mowing	None
Antigonon leptopus	coral vine	Glyphosate	Pull or dig	None
Aralia chinensis	Chinese angelica tree	Glyphosate or Tordon	Dig or repeated cutting	None
Araujia sericifera	bladderflower	Escort; Glyphosate	Dig, bag & burn	None
Arctium lappa	greater burdock	Glyphosate	Dig, bag & burn	None
Arctium minus	common burdock	Glyphosate	Dig, bag & burn	None
Arctotheca calendula	capeweed	Onduty	Repeated tillage	None
Ardisia crennata	coral ardisia	Glyphosate or Triclophyhr	Pull, bag & burn	None
Arrhenatherum elatius	tall oatgrass	Arsenal 50	Repeated tillage	*Minois dryas*
Artemisia absinthium	absinth wormwood	Dicamba; 2, 4-D; Picloram and Glyphosate	Tillage and repeated mowing	None
Artemisia annua	annual wormwood	Dicamba; 2, 4-D; Picloram and Glyphosate	Tillage and repeated mowing	None
Arthraxon hispidus	hairy jointgrass	Glyphosate	Tillage and repeated mowing	None
Asphodelus fistulosus	onionweed	-	-	-
Atriplex semibaccata	Australian saltbush	-	-	-
Avena barbata	slender oat	2, 4-D + Dicamba; Triattate	Repeated tillage	None
Avena fatua	wild oat	2, 4-D + Dicamba; Triattate	Repeated tillage	None
Avena sterilis	animated oat	2, 4-D + Dicamba; Triattate	Repeated tillage	None
Barbarea vulgaris	yellow rocket	-	-	-
Bassia hyssopifolia	smother weed	None	Pull, till or repeated mowing	*Lygus* sp.

Scientific Name	Common Name	Chemical	Mechanical	Biological
Bauhinia variegata	orchid tree	-	-	-
Begonia cucullata	clubbed begonia	-	-	-
Bellardia trixago	bellardia	-	-	-
Bellis perennis	English daisy	-	-	-
Berberis thunbergii	Japanese barberry			
Berberis vulgaris	barberry			
Berteroa incana	common hoary alyssum			
Brachypodium distachyon	purple false brome			
Brassica tournefortii	wild turnip		Pull	
Briza maxima	quakegrass, rattlesnake grass	Glyphosate	Repeated mowing & burning	None
Briza minor	quakinggrass, little rattlesnake grass	Glyphosate	Repeated mowing & burning	None
Bromus catharticus	rescue grass	Glyphosate	Cutting & burn	None
Bromus commutatus	hairy chess	Glyphosate	Repeated mowing & burning	None
Bromus diandrus	ripgut brome	Glyphosate	Repeated mowing & burning	None
Bromus inermis	smooth brome	Glyphosate	Repeated mowing & burning	None
Bromus japonica	Japanese bromegrass	Glyphosate	Repeated mowing & burning	None
Bromus rubens	red brome, foxtail brome	Glyphosate	Repeated mowing & burning	None
Bromus secalinus	cheat	Glyphosate	Repeated mowing & burning	None
Bromus sterilis	poverty brome, barren bromegrass	Glyphosate	Repeated mowing & burning	None
Bromus tectorum	downy brome	Glyphosate	Repeated mowing & burning	None
Broussonetia papyrifera	paper mulberry			
Bryonia alba	white bryony			
Bupleurum rotundifolium	hound's ear			

Scientific Name	Common Name	Chemical	Mechanical	Biological
Calystegia pellita	calystegia	-	-	-
Campanula rapunculoides	creeping bellflower	Gyphosphate; 2, 4-D	Dig	None
Cardamine hirsuta	hairy bittercress	Gyphosphate; Toryzalion	Pull, dig & bag	None
Cardaria chalapensis	lens podded hoary cress	2, 4-D + Glyphsophate	Pull, dig & bag	None
Cardaria draba	heart podded hoarycress	Glyphosate + 2, 4-D	Pull, bag & burn	*Brevicoryne brassicae, Myzodes persicae, Meligethes* sp.
Cardaria pubescens	hairy whitetop	Glyphosate + 2, 4-D	Pull, bag & burn	None
Carduus acanthoides	plumless thistle	Glyphosate + 2, 4-D	Tillage	*Urophora solstitialis*
Carduus crispus	welted thistle	Glyphosate + 2, 4-D	Tillage	*Rhinocyllus conicus*
Carduus nutans	musk thistle	2, 4-D; Dicamba	Tillage	*Rhinocyllus conicus*
Carduus pycnocephalus	Italian thistle	MCPA	Tillage	*Altesnaria* sp., *Puccinia* sp.
Carduus tenuiflorus	distaff thistle	MCPA	Tillage	*Alternaria* sp..
Carex kobomugi	Japanese sedge	Gyphosphate	Pull, dig	None
Carpobrotus edulis	Hottentot fig	Gyphosphate	Pull	None
Carthamus lanatus	wolly distaff thistle	Clopyralid; 2, 4-D; Dicamba or Glyphosate	Pull, dig	None
Carthamus leucocaulos	whitestem distaff thistle	Clopyralid; 2, 4-D; Dicamba or Glyphosate	Pull, dig	None
Casuarina spp.	Australian pine	Systemic Type	Bag & burn	None
Cayratia japonica	bushkiller	-	-	-
Celastrus orbiculata	oriental bittersweet	Glyphosate	Cut, pull & dig	None
Centaurea biebersteinii	spotted knapweed	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Urophora* sp., *Agapeta zoegana*
Centaurea calcitrapa	purple starthistle	Glyphopshate; 2, 4-D; Dicamba	Dig	*Bangasternus fausti*
Centaurea cyanus	garden cornflower	Glyphopshate; 2, 4-D; Dicamba	Dig	None
Centaurea debeauxii	meadow knapweed	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Agapeta zoegana*
Centaurea diffusa	diffuse knapweed	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Bangasternus fausti*

Scientific Name	Common Name	Chemical	Mechanical	Biological
Centaurea iberica	Iberian starthistle	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Bangasternus fausti*
Centaurea jacea	Brown knapweed	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Urophora quadrifasciata*
Centaurea macrocephala	bighead knapweed	Glyphopshate; 2, 4-D; Dicamba	Repeated mowing & digging	None
Centaurea melitensis	Malta starthistle	Glyphopshate; 2, 4-D; Dicamba	Repeated mowing & digging	None
Centaurea nigra	black knapweed	Glyphopshate; 2, 4-D; Dicamba	Fire, tillage, mowing	None
Centaurea nigrescens	Tyrol knapweed	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	None
Centaurea solstitialis	yellow starthistle	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Bangasternus* sp.
Centaurea sulphurea	sulphur knapweed, Sicilian starthistle	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Bangasternus* sp.
Centaurea trichocephala	hairy head knapweed	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Bangasternus* sp.
Centaurea triumfetti	squarrose knapweed	Glyphopshate; 2, 4-D; Dicamba	Pull, bag & burn	*Bangasternus* sp.
Ceratocephala testiculata	bur buttercup			
Ceratonia siliqua	St. John's bread			
Chenopodium ambrosioides	Mexican tea			
Chenopodium murale	nettleleaf goosefoot			
Chondrilla juncea	rush skeletonweed	Transline picloram; 2, 4-D	None	*Cystiphora schmidti, Aceria chondrillae*
Chrysanthemum leucanthemum	oxeye daisy	2, 4-D; Banvel	Dig	None
Chrysopogon aciculatus	small neddled goldbeard			
Cichorium intybus	chicory			
Cinnamomum camphora	camphor tree	Glyphosate	Repeated cutting	None
Cirsium arvense	Canadian thistle	Tordon; Roundup	Pull, bag & burn	*Trichosirocalus horridus*
Cirsium vulgare	bull thistle	Tordon; Roundup	Pull, bag & burn	*Rhinocyllys conicus*

Scientific Name	Common Name	Chemical	Mechanical	Biological
Clematis orientalis	Chinese clematis	Versatil; Escort	Pull, dig or cut	None
Clematis terniflora	leatherleaf clematis	Versatil; Escort	Pull, dig or cut	None
Clematis vitalba	old man's beard	Versatil; Escort	Pull, dig or cut	None
Cleome gynandra	spiderflower			
Clerodendrum bungei	rose glorybower			
Cnicus benedictus	blessed thistle			
Coccinia grandis	ivy gourd			
Coincya monensis	star-mustard			
Commelina benghalensis	spiderwort			
Conium maculatum	poison hemlock	Escort; Tordon; Glyphosate	Pull, bag & burn	None
Convalaria majalis	lily-of-the-valley			
Convolvulus wallichianus	Wallich's bindweed	Glyphosate; Dicamba	None	*Aceria malherbe, Tyta luctuose*
Conyza bonariensis	hairy fleabane	Glyphosate		
Coronilla varia	crownvetch	Glyphosate	Repeated mowing & burning	None
Cortaderia selloana	pampasgrass	Glyphosate	Pull & dig	None
Cosmos bipinnatus	cosmos			
Cosmos sulphureus	cosmos			
Crataegus monogyna	singleseed hawthorn			
Crepis capillaries	smooth hawkweed			
Crepis setosa	bristly hawksbeard			
Crepis tectorum	narrow-leaved hawksweed			
Crotalaria spectabilis	showy rattlebox		Pull, dig	
Crupina vulgaris	common crupina			
Cucumis melodudiam	melon	Triclopyr	Tillage	None
Cucumis myriocarpus	paddy melon	Triclopyr	Tillage	None
Cupaniopsis anacardioides	carrotwood	Triclopyr	None	None

Scientific Name	Common Name	Chemical	Mechanical	Biological
Cynanchum louiseae	black swallowwort, climbing milkweed			
Cynanchum rossicum	dog-strangling vine, European swallow-wort			
Cynara cardunuculus	artichoke thistle			
Cynodon aethiopicus	bermudagrass	Roundup; Rodeo	Dig & pull	None
Cynodon dactylon	bermudagrass	Roundup; Rodeo	Dig & pull	None
Cynodon magennisii	bermudagrass	Roundup; Rodeo	Dig & pull	None
Cynodon nlemfuensis	bermudagrass	Roundup; Rodeo	Dig & pull	None
Cynodon plectostachyus	bermudagrass	Roundup; Rodeo	Dig & pull	None
Cynodon transvaalensis	bermudagrass	Roundup; Rodeo	Dig & pull	None
Cynoglossum officinale	houndstongue	2, 4-D; Amine; Chlorsulfuron; Dicamba	Repeated mowing	*Mogulones cruciger, Longitarsus quadrignttatus*
Cynosurus echinatus	bristly dogstail grass			
Cyperus rotundus	purple nutsedge	Dual; magnum	Tillage	*Bactaca veturana, Puccinia canaliculata*
Cytisus scoparius	Scotch broom	Grazon; Tordon or Escort	Dig	None
Cytisus striatus	striated broom	Grazon; Tordon or Escort	Dig	None
Dactylis glomerata	orchardgrass			
Datura quercifolia	Chinese thornapple			
Daucus carota	wild carrot, Queen Anne's lace			
Delairea odorata	German ivy	Glyphosate	Pull, dig	None
Dianthus armeria	Deptford pink			
Dioscorea alata	white yam			
Dioscorea bulbifera	Chinese yam, air potato			
Dipsacus fullonum	common teasel			
Dipsacus laciniatus	cutleaf teasel			
Dipsacus sativus	indian teasel			
Draba verna	spring Whitlowgrass			

Scientific Name	Common Name	Chemical	Mechanical	Biological
Echinochloa crus-galli	barnyardgrass			
Echium vulgare	blueweed			
Ehrharta calycina	veldtgrass	Glyphosate	Pull & dig	None
Elaeagnus angustifolia	Russian olive	2, 4-D; Glyphosate	Repeated cutting, pulling & digging	None
Elaeagnus multiflora	cherry silverberry	2, 4-D; Glyphosate	Repeated cutting, pulling & digging	None
Elaeagnus pungens	thorny olive	2, 4-D; Glyphosate	Repeated cutting, pulling & digging	None
Elaeagnus umbellata	autumn olive	2, 4-D; Glyphosate	Repeated cutting, pulling & digging	None
Eleusine indica	goosegrass, wiregrass			
Elytrigia repens	quackgrass	Atrazine; Roundup	Repeated tillage	None
Emex australis	southern dock			
Emex spinosa	spined dock			
Epipactis helleborine	helleborine orchid			
Eragrostis cilianensis	stinkgrass			
Erechtites glomerata	Australian fireweed			
Erechtites minima	Australian fireweed			
Eriochloa villosa	hairy cupgrass			
Erodium cicutarium	redstem filaree			
Erodium moschatum	musky stork's bill			
Erysimum cheiranthoides	wormseed mustard			
Erysimum repandum	spreading wallflower			
Euonymus alata	winged burning bush	Glyphosate	Repeated cutting or digging	None
Euonymus fortunei	winter creeper	Glyphosate	Repeated cutting or digging	None
Euphorbia cyparissias	cypress spurge	2, 4-D; Dicamba	Dig	*Hyles euphorbiae, Oberea erythrochphala, Aphthona* sp..
Euphorbia esula	leafy spurge	2, 4-D; Dicamba	Dig	None

Scientific Name	Common Name	Chemical	Mechanical	Biological
Euphorbia myrsinites	myrtle spurge	2, 4-D; Dicamba	Dig	None
Euphorbia oblongata	oblong spurge, eggleaf spurge	2, 4-D; Dicamba	Dig, bag & burn	None
Euphorbia serrata	serrate spurge	2, 4-D; Dicamba	Dig, gab & burn	None
Euphorbia terracina	Geraldton carnation spurge	2, 4-D; Dicamba	Dig, bag & burn	None
Fagopyrum tataricum	tartary buckwheat			
Fatoua villosa	hairy crabweed			
Festuca arundinaceum	tall fescue	Glyphosate	Repeated mowing	None
Festuca pratensis *Festuca elatior*	meadow fescue	Glyphosate	Repeated mowing	None
Ficus carica	fig	Escort; Glyphosate	Dig, bag & burn	None
Foeniculum vulgare	sweet fennel	Glyphosate	Pulling or repeated tillage	None
Frangula alnus	glossy buckthorn			
Galega officinalis	goat's rue			
Galeopsis bifida	hempnettle			
Genista monspessulana	frenchbroom	None	Pull	Goats
Geranium dissectum	cutleaf geranium	Deurinol; Treflan	Pull	*Acyrthosiphon malvae*
Glaucium corniculatum	red horn poppy			
Glechoma hederacea	creeping charlie			
Halogeton glomeratus	halogeton			
Hedera helix	English ivy	Tordon	Pull or dig	None
Hemerocallis fulva	orange daylily			
Heracleum mantegazzianum	giant hogweed	Glyphosate	Dig	Cattle & pigs
Hesperis matronalis	dame's rocket			
Hibiscus syriacus	rose of Sharon			
Hibiscus trionum	Venice mallow			
Hieracium aurantiacum	orange hawkweed	2, 4-D mixed w/Dicamba	Dig	None
Hieracium caespitosum	meadow hawkweed	2, 4-D mixed w/Dicamba	Dig	None

Scientific Name	Common Name	Chemical	Mechanical	Biological
Hieracium floribundum	yellow-devil hawkweed	None	None	None
Hieracium laevigatum	smooth hawkweed			
Hieracium pilosella	mouse ear hawkweed			
Hieracium piloselloides	kingdevil hawkweed			
Holcus lanatus	velvetgrass			
Hordeum murinum	mouse barley			
Hordeum vulgare	barley			
Humulus japonicus	Japanese hop			
Hyoscyamus niger	black henbane	Glyphosate	Pull or dig	None
Hypericum perforatum	klamathweed, Common St. Johnswort	2, 4-D; Piclorem; Roundup	Tillage	*Chrysolina hyperici, C. quadragemina, Aphthona* sp..
Hypochaeris radicata	spotted cats ear	Glyphosate	Dig	None
Ilex aquifolium	English holly			
Imperata brasiliensis	Brazilian imperata	Glyphosate	Dig, pull or cut & burn	None
Imperata cylindrica	cylindrical imperata	Roundup	Dig, pull or burn	None
Ipomoea cairica	mile-a-minute weed	Roundup	Dig, pull or burn	None
Ipomoea hederacea	ivyleaf morningglory	Roundup	Dig, pull or burn	None
Ipomoea purpurea	tall morningglory	Roundup	Dig, pull or burn	None
Iris pseudacorus	pale yellow iris			
Isatis tinctoria L.	dyer's woad	2, 4-D; Escort	Pull & dig	None
Ischaemum rugosum	wrinkle duck beak			
Kochia scoparia	Mexican fireweed	2, 4-D; Banvel	Tillage	None
Koelreuteria elegans	golden rain tree			
Lactuca serriola	prickly lettuce			
Lamium amplexicaule	Henbit			
Lamium purpureum	hybrid nettle			
Lantana camara	lantana	Escort or Glyphosate	Repeated cutting	None

Scientific Name	Common Name	Chemical	Mechanical	Biological
Lappula squarrosa	european stickseed			
Lapsana communis	nipplewort			
Leonorus cardiaca	motherwort			
Lepidium campestre	field pepperweed	Glyphosate	Pull, bag & burn	None
Lepidium latifolium L.	perennial peppercress	Glyphosate	Pull, bag & burn	None
Lepidium perfoliatum	clasping pepperweed	Glyphosate	Pull, bag & burn	None
Lepyrodiclis holosteoides	lepyrodiclis	None	Pull, bag & burn	None
Lespedeza bicolor	bicolor lespedeza	Glyphosate	Repeated mowing	None
Lespedeza cuneata	Chinese lespedeza	Triclopyr; Clopyralid; Glyphosphage	Repeated mowing	None
Ligustrum lucidum	glossy privet	Triclopyr; Clopyralid; Glyphosphage	Repeated mowing	None
Ligustrum obtusifolium	border privet	Accord; Roundup	Repeated mowing or cutting	None
Ligustrum sinense	Chinese privet	Accord; Roundup	Repeated mowing or cutting	None
Ligustrum vulgare	European privet	Accord; Roundup	Repeated mowing or cutting	None
Linaria dalmatica	Dalmatian toadflax	Picloram + 2, 4-D	Pull, bag & burn	*Brachypterolus pulicarus, Aphthona* sp., *Calophasia lunula*
Linaria vulgaris	yellow toadflax	Picloram + 2, 4-D	Pull, bag & burn	*Brachypterolus pulicarus, Aphthona* sp., *Calophasia lunula*
Lolium perenne	perennial ryegrass	Glyphosate	Repeated mowing	None
Lolium temulentum	darnel	Glyphosate	Repeated mowing	None
Lonicera fragrantissima	January jasmine	Escort; Accord; Roundup	Hand pulling or digging	None
Lonicera japonica	Japanese honeysuckle	Escort; Accord; Roundup	Hand pulling or digging	None
Lonicera mackii	amur honeysuckle	Escort; Accord; Roundup	Hand pulling or digging	None

Scientific Name	Common Name	Chemical	Mechanical	Biological
Lonicera morrrowii	Morrow's honeysuckle	Glyphosate	Pull or dig out	None
Lonicera standishii	Standish's honeysuckle	Glyphosate	Pull or dig out	None
Lonicera tatarica	tatarian honeysuckle	Glyphosate	Hand pulling	*Hyadaphis tatariace*
Lotus corniculatus	birdfoot trefoil, birdfoot deervetch			
Lycium barbarum	matrimony vine			
Lygodium japonicum	Japanese climbing fern			
Lygodium microphyllum	small-leaved climbing fern			
Lysimachia vulgaris	garden loosestrife	Glyphosate; Triclopyr + 2, 4-D	Pull, bag & burn	*Galerucella calmariensis, Gopusilla, Hylobius transversovittatus*
Lythrum hyssopifolium	hyssop loosestrife	Glyphosate; Triclopyr + 2, 4-D	Pull, bag & burn	*Galerucella calmariensis, Gopusilla, Hylobius transversovittatus*
Lythrum maritimum	pukamole	Glyphosate; Triclopyr + 2, 4-D	Pull, bag & burn	*Galerucella calmariensis, Gopusilla, Hylobius transversovittatus*
Lythrum portula	spatulaleaf loosestrife	Glyphosate; Triclopyr + 2, 4-D	Pull, bag & burn	*Galerucella calmariensis, Gopusilla, Hylobius transversovittatus*
Lythrum thymifolia	thymeleaf loosestrife	Glyphosate; Triclopyr + 2, 4-D	Pull, bag & burn	*Galerucella calmariensis, Gopusilla, Hylobius transversovittatus*
Lythrum virgatum	wandlike loosestrife	Glyphosate; Triclopyr + 2, 4-D	Pull, bag & burn	*Galerucella calmariensis, Gopusilla, Hylobius transversovittatus*
Macfadyena unguis-cati	purple aster			
Macleaya cordata	tree celandine			
Marrubium vulgare	horehound			
Medicago lupulina	hop medic			

Scientific Name	Common Name	Chemical	Mechanical	Biological
Medicago polymorpha	burclover	Glyphosate	Pull , dig or cut	None
Melaleuca quinquenervia	paperbark tree	None	Pull, dig or cut	*Oxyops vitosa, Lophyrotoma zonalis*
Melia azedarach	Chinaberry tree	Garlon	Pull, dig or cut	None
Melilotus officinalis	yellow sweetclover	Glyphosate; 2, 4-D + Dicamba	Repeated burn & mowing	*Sitona cyulindricollis*
Melinis repens	Natal grass			
Mesembryanthemum crystallinum	ice plant	Glyphosate	Pull & dig	None
Microstegium vimineum	Japanese stiltgrass	Glyphosate	Pull & dig	None
Milium vernale	spring millet grass			
Mimosa diplotricha	two-thrush mimosa			
Mimosa pigra	slow mimosa			
Miscanthus floridulus	Japanese silvergrass			
Miscanthus sinensis	zebra grass			
Misopates orontium	lesser snapdragon			
Morus alba	white mulberry			
Mosla dianthera	miniature beefsteak			
Muscari botryoides	grape hyacinth			
Muscari comosum	tassel hyacinth			
Muscari neglectum	common grape hyacinth			
Nandina domestica	heavenly bamboo			
Nardus stricta	moor matgrass			
Nepeta cataria	catnip			
Nephrolepis cordifolia	sword fern	Glyphosate	Dig	None
Neyraudia reynaudiana	Burma reed	Roundup	Cut & burn	None
Onopordum acanthium	Scotch thistle	Dicamba w/2, 4-D	Dig	Goats
Onopordum illyricum	Illyrian thistle	Dicamba; 2, 4-D	Repeated mowing	Goats
Onopordum tauricum	Scotch thistle	Dicamba; 2, 4-D	Repeated mowings	None

Scientific Name	Common Name	Chemical	Mechanical	Biological
Ornithogalum umbellatum	Star-of-Bethlehem			
Oxalis pas-caprae	Bermuda buttercup	Glyphosate	Pull & dig	None
Paederia cruddasiana	sewer-vine			
Paederia foetida	skunk-vine			
Panicum antidotale	blue panicgrass			
Panicum miliaceum	wild-proso millet			
Papaver dubium	poppy			
Parthenium hysterophorus	Santa Maria feverfew			
Paspalum dilatatum	dallis grass			
Paspalum scrobiculatum	kodo millet	Glyphosate	Repeated mowing	None
Pastinaca sativa	wild parsnip			
Paulownia tomentosa	princess tree			
Peganum harmala	harmel, African rue	Glyphosate	None	None
Pennisetum ciliare	buffelgrass	Glyphosate	Repeated mowing	Sheep & goats
Pennisetum clandestinum	Kikuyu grass	Glyphosate	Repeated mowing	Sheep & goats
Pennisetum macrourum	African feathergrass	Glyphosate	Repeated mowing	Sheep & goats
Pennisetum pedicellatum	kyasuma-grass	Glyphosate	Repeated mowing	Sheep & goats
Pennisetum polystachyon	mission grass	Glyphosate	Repeated mowing	Sheep & goats
Pennisetum purpureum	elephant grass	Glyphosate	Repeated mowing	Sheep & goats
Pennisetum setaceum	crimson fountaingrass	Dicamba; 2, 4-D	Pull, bag & burn	None
Pennisetum villosum	feathertop	Glyphosate	Repeated mowing	Sheep & goats
Perilla frutescens	beefsteak mint			
Phalaris aquatica	Hardinggrass			
Phalaris canariensis	reed canarygrass	Rodeo	Cutting & burning	None
Phalaris minor	littleseed canarygrass			
Phellodendron amurense	Amur corktree			
Phleum pratense	timothy			

Scientific Name	Common Name	Chemical	Mechanical	Biological
Phyllanthus urinaria	chamber bitter			
Phyllostachys aurea	golden bamboo	Amitrol; Glyphosate	Repeated cutting & burning	None
Poa bulbosa	boulbous bluegrass	Atrazine; Roundup	Cutting & burning	None
Poa compressa	Canada bluegrass	Atrazine; Roundup	Repeated burning	None
Polygonum aviculare	prostrate knotweed	Glyphosate	Digging & pulling	None
Polygonum convolvulus	wild buckwheat	Glyphosate	Digging & pulling	None
Polygonum cuspidatum	Japanese knotweed	Glyphosate	Digging & pulling	None
Polygonum orientale	Prince's feather	Glyphosate	Digging & pulling	None
Polygonum perfoliatum	mile-a-minute weed	Glyphosate	Digging & pulling	None
Polygonum persicaria	lady's-thumb	Glyphosate	Digging & pulling	None
Polygonum sachalinese	giant knotweed, sakhalin knotweed	Atrazine; Dicamba; 2, 4-D	Digging & pulling	None
Populus alba	white poplar			
Potentilla recta	sulfur cinquefoil	Tordor; 2, 4-D	Pull or dig	None
Prosopis pallida	cloaked prosopis	None	None	None
Prosopis strombulifera	spreading prosopis	None	None	None
Pteris vittata	Chinese brake			
Pueraria montana	kudzu	Glyphosate	Cut, bag & burn	None
Ranunculus acris	tall buttercup			
Ranunculus arvensis	corn buttercup			
Ranunculus bulbosus	bulbous buttercup			
Ranunculus repens	creeping buttercup			
Ranunculus sardous	hairy buttercup			
Rapistrum rugosum	common giant mustard			
Rhamnus arguta	buckthorn	Glyphosate	Repeated cutting & pulling	*Scotosia vetulata, Triphos dubiata*
Rhamnus cathartica	European buckthorn	Glyphosate	Repeated cutting & pulling	*Scotosia vetulata, Triphos dubiata*
Rhamnus davurica	Dahurian buckthorn	Glyphosate	Repeated cutting & pulling	*Scotosia vetulata, Triphos dubiata*

Scientific Name	Common Name	Chemical	Mechanical	Biological
Rhamnus utilius	Chinese buckthorn	Glyphosate	Repeated cutting & pulling	*Scotosia vetulata, Triphos dubiata*
Rhamus japonica	Japanese buckthorn	Glyphosate	Repeated cutting & pulling	*Scotosia vetulata, Triphos dubiata*
Rhodomyrtus tomentosa	downy myrtle			
Rhodotypos scandens	jet bead			
Ricinus communis	castorbean			
Rorippa austriaca	Austrian fieldcress	2, 4-D; Glyphosate	Repeated tillage	None
Rorippa sylvestris	yellow fieldcress	2, 4-D; Glyphosate	Repeated tillage	None
Rosa multiflora	multiflora rose	Glyphosate	Repeated cutting or mowing	Not yet available
Rubus discolor	Himalayan blackberry			
Rubus laciniatus	cut-leaved blackberry			
Rubus phoenicolasius	wine raspberry			
Ruellia brittoniana	Mexican petunia			
Rumex acetosella	sorrel			
Rumex crispus	sour dock			*Gastrophysa viridula, Hypera rumicis, Uromyces rumicis*
Rumex obtusifolius	bitter dock			*Gastrophysa viridula, Hypera rumicis, Uromyces rumicis*
Saccharum spontaneum	wild sugarcane			
Sagina procumbens	birdseye pearlwort			
Salsola collina	slender Russian thistle			
Salsola kali	Russian thistle	2, 4-D + Glyphosate	Tillage	*Coleophora klimeschiella + C. parthenica*
Salsola paulsenii	barbwire Russian thistle	2, 4-D + Glyphosate	Tillage	*Coleophora klimeschiella + C. parthenica*
Salsola tragus	Common Russian thistle	2, 4-D + Glyphosate	Tillage	*Coleophora klimeschiella + C. parthenica*

Scientific Name	Common Name	Chemical	Mechanical	Biological
Salsola vermiculata	tumbleweed	2, 4-D + Glyphosate	Tillage	*Coleophora klimeschiella* + *C. parthenica*
Salvia aethiopis	Mediterranean sage	2, 4-D & Dicamba	Dig or till	*Phrydiuchus tau*
Salvia pratensis	salvia	2, 4-D & Dicamba	Dig or till	*Phrydiuchus tau*
Salvia sclarea	clary sage	Picloram; 2, 4-D; Dicamba	Dig or till	*Phrydiuchus tau*
Salvia superba	meadow sage	Picloram; 2, 4-D; Dicamba	Dig or till	*Phrydiuchus tau*
Sapium sebiferum	tallowtree	Garlon; Dow Elanco	None	*Eumeta* sp., *Meloidogyne javanica*
Saponaria officinalis	bouncingbet			
Schinus molle	pepper tree			
Schinus terebinthif	Brazillian pepper-tree			
Schismus arabicus	Mediterranean grass			
Schismus barbatus	Mediterranean grass			
Scleranthus annuus	German knotgrass			
Sclerochloa dura	hardgrass			
Scolymus hispanicus	golden thistle			
Senecio jacobaea	tansy ragwort	Tordon; 2, 4-D	Repeated tillage	*Longitarsus jacobaeae, Pegohylemyia seneciella*
Senecio squalidus	Oxford ragwort	Tordon; 2, 4-D	Repeated tillage	*Longitarsus jacobaeae, Pegohylemyia seneciella*
Senecio vulgaris	common groundsel	Tordon; 2, 4-D	Repeated tillage	*Longitarsus jacobaeae, Pegohylemyia seneciella*
Senna occidentalis	coffee senna			
Sesbania punicea	rattlebox			
Setaria pumila	kavatta grass			

Scientific Name	Common Name	Chemical	Mechanical	Biological
Setaria pumila var. pallide-fusca	yellow bristlegrass			
Setaria verticillata	bristly foxtail	Primisulfuron + Atrazine	Repeated cultivation	None
Setaria viridis	green foxtail, green bristlegrass	Primisulfuron + Atrazine	Repeated cultivation	None
Silene vulgaris	bladder campion			
Silybum marianum	blessed milkthistle	Dicamba; 2, 4-D	Digging	*Rhinocyllus conicus*
Sisymbrium altissimum	tumble mustard			
Sisymbrium irio	London rocket			
Sisymbrium loeselii	tallhedge mustard			
Sisymbrium officinale	hedge mustard			
Solanum cardiophyllum	heartleaf horsenettle	2, 4-D + Banvel	Repeated mowing	None
Solanum diphyllum	twinleaf nightshade	2, 4-D + Banvel	Repeated mowing	None
Solanum dulcamara	bitter nightshade	2, 4-D + Banvel	Repeated mowing	None
Solanum lanceolatum	lanceleaf nightshade	2, 4-D + Banvel	Repeated mowing	None
Solanum marginatum	white-margined nightshade	2, 4-D + Banvel	Repeated mowing	None
Solanum nigrum	black nightshade	2, 4-D + Banvel	Repeated mowing	None
Solanum viarum	tropical soda apple	2, 4-D + Banvel	Repeated mowing	None
Soliva sessilis	lawn burweed	2, 4-D	Digging	None
Sonchus asper	perennial sowthistle	Dicamba; MCPA Amine;, 2, 4-D	Tillage	Sheep & cattle
Sonchus oleraceus	annual sowthistle	Dicamba; MCPA Amine;, 2, 4-D	Tillage	Sheep & cattle
Sorghum almum	sorghum-almum	Glyphosate	Repeated tillage or mowing	None
Sorghum bicolor	shattercane	Glyphosate	Repeated tillage or mowing	None
Sorghum halepense	johnson grass	Roundup or Rodeo	Repeated tillage or mowing	None
Spartina anglica	cordgrass	Rodeo	Digging & pulling	*Claviceps purpurea, Prokelisia marginata*
Spartina densiflora	denseflower cordgrass	Rodeo	Digging & pulling	*Claviceps purpurea, Prokelisia marginata*

Scientific Name	Common Name	Chemical	Mechanical	Biological
Spartium junceum	Spanish broom	2, 4-D & Picloran	Digging & pulling	Goats & chickens, *Aphis cytisoium, Eriophyes spartii*
Spergula arvensis	corn spurry			
Sphaerophysa salsula	Austrian peaweed, swainsonpea	Glyphosate	None	None
Spiraea japonica	Japanese spiraea			
Stellaria graminea	little starwort			
Stellaria media	common chickweed			
Symphytum asperum	rough comfrey	Glyphosate	Repeated mowing & tillage	None
Tagetes minuta	wild marigold	2, 4-D; MCPA; Glyphosate	Repeated tillage	None
Tamarix africana	saltcedar	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tamarix aphylla	saltcedar	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tamarix aralensis	saltcedar	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tamarix canariensis	saltcedar	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tamarix chinensis	Chinese tamarisk	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tamarix galllica	saltcedar	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tamarix parviflora	saltcedar	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tamarix ramosissima	saltcedar	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tamarix tetragyna	saltcedar	Rodeo, Arsenal	Pull, till, dig	*Trabutina mannipava, Diorhabda elongata*
Tanacetum vulgare	common tansy			
Thlaspi arvense	fanweed			
Thymelaea passerina	Mezereon Spurge flax	None	None	None
Thymus praecox	creeping thyme			

Scientific Name	Common Name	Chemical	Mechanical	Biological
Tradescantia fluminensis	white-flowered wandering jew	Grazon	Pull	None
Tradescantia spathacea	oyster plant			
Tragopogon dubius	goat's beard			
Triadica sebifera	Chinese tallow tree			
Tribulus cistoides	puncture vine	Glyphosate	Pull, dig, repeated tillage	None
Tribulus terrestris	puncturevine			
Tridax procumbens	coat buttons			
Trifolium arvense	oldfield clover			
Trifolium campestre	field clover			
Trifolium incarnatum	crimson clover			
Trifolium repens	white clover, sweet clover			
Triphasia trifolia	lime berry			
Tripleurospermum perforata	scentless chamomile			
Tussilago farfara	coltsfoot			
Ulex europaeus	gorse	Glyphosate; Tordon	Burn	*Tetranychus lintearius*, goats, *Exapion ulicis*
Ulmus parviflora	Chinese elm			
Ulmus pumila	Siberian elm			
Urochloa brizanth	palisade signalgrass			
Urochloa mutica	para grass			
Urochloa ramosa	browntop millet			
Valeriana officinalis	garden heliotrope			
Ventenata dubia	North Africa grass			
Verbascum blattaria	moth mullein			
Verbascum thapsus	common mullein	Glysphosphate; Triclopyr	Pull, bag & burn	*Gymnaetron tetsan, Cucullia verbasci*
Vernicia fordii	tung oil tree			

Scientific Name	Common Name	Chemical	Mechanical	Biological
Veronica arvensis	corn speedwell			
Veronica filiformis	slender speedwell			
Veronica persica	winter speedwell			
Viburnum lantana	wayfaring tree			
Vicia sativa	garden vetch			
Vicia tetrasperma	sparrow vetch			
Vicia villosa	hairy vetch			
Vinca major	bigleaf periwinkle	Amitrol; Glyphosate	Dig or pull	None
Vinca minor	periwinkle	Amitrol; Glyphosate	Dig or pull	None
Viola arvensis	field violet			
Vulpia myuros	rat-tailed fescue			
Wisteria floribunda	Japanese wisteria			
Wisteria sinensis	Chinese wisteria	Tordon	Pull or dig	None
Xanthium spinosum	spiny cocklebur	Metribuzin; Dicamba	Pull, bag & burn	*Phaneta imbridana, Coleopterai cerambycidae*
Zygophyllum fabago	Syrian beancaper	None	Pull or dig	None

* **Note**: A blank within the control box indicates that no definitive control has been identified via scientific research or data not available.